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# STUDIES ON ACQUACULTURE AND POPULATION DEPENDENT ON IT'S IN MADHUBANI DISTRICT OF BIHAR, INDIA

**RAKESH KUMAR & JHA. A.C**

*Lalit Narayan Mithila University, Darbhanga, Bihar, India*

***ABSTRACT***

***The present investigation was carried out in year 2011-2013 by using secondary data. Madhubani district, heart of Mithila is known as land of ponds. The ponds of Madhubani are important for common need of community, livelihood and nutrition, recharging of groundwater. Fish is one of the popularly consumed items in Bihar and is fastest growing subsector indicating a growth rate of over 10 per cent per annum. Aquaculture acts like insurance against failure main crops in agriculture, creates employment and fulfil the needs of animal proteins for local population at cheaper rate.***

***KEYWORDS: Livelihood and Nutrition, Livelihood & Nutrition***

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## INTRODUCTION

Aquaculture is the controlled cultivation and harvest of aquatic animals and plants. Aqua culturists manipulate certain components of the environment to achieve greater control over production of aquatic organisms than in normally possible in nature. Ponds built on the best agricultural land have the highest natural productivity. High production from aquaculture is also possible in ponds built on lands which are unsuitable for agriculture. Aquaculture can contribute to the conservation of natural resources, especially water and soil. Ponds can reduce the dangers of downstream flooding by holding water height in water sheds and checking the erosional force of sudden runoff. Ponds maintain soil moisture in their vicinity and thus support vegetation and wild life. Even a small pond can contribute substantially to acquire income or reduce family expenditure for food requirements. Aquaculture provides fresh fish available in the rural areas. Large population of rural poor are found living in isolated areas where transportation and market facilities are to make them available with required fish consumption. Aquaculture production is basically dependant on factors like the physical environment, culture facilities, available nutrient inputs, species cultured and ability of producers to balance all the factors in profitable package. The expansion of aquaculture production has profound implications for labour relations, rural poverty and class formation. Aquaculture requires access to capital for start-up and running costs, and thus has much more barriers to entry than fishing in capture fisheries does. Russed et al. (2013) found that small holder households adopting fish farming are often those who have start up capital, raising concerns about equity. Despite the challenges, however, aquaculture holds significant potential for pro-poor rural development (Demessie ., S. 2003)).

Despite abundant aquatic resources in terms of about 3,200 Km. of rivers, 100,000 hectare chaur and flood plain wetlands, 9000 hectares of Oxbow or mouns, 7,200 hectares of reservoirs and 69,000 hectares of ponds and tanks, fish supply is short of demand in the state of Bihar. It takes into account the resources available in different districts and the mapping that has been done for water bodies above 0.5 hectare in each Block of the State.

Madhubani contains 3743 hectares.

Madhubani occupies an area of 3501 $Km^2$ and has a population of 35, 70, and 651 (as of 2001). The district comprises 5 sub-division viz. Madhubani, Jayanagar, Benipatti, Jhanjharpur and phulparas. Madhubani comprises 21 Blocks, viz. Khutauna, Phulparas, Laukahi, Ghonghardiha, Rahika, Pandaul, Rajnagar, Khajauli, Kaluahi, Babubarhi, Madhwapur, Harlakhi, Bisfi, Benipatti, Lakhnaur, Madhepur, Jhanjharpur, Andhratharhi, Basopatti, Ladania and Jaynagar.

Madhubani district is situated at Indo-Nepal boarder and the people of this district mainly depend on agriculture and fisheries, which are still managed largely by the traditional techniques. Aquaculture may improve the economy of the people of this district level upto the national standards.

## MATERIALS AND METHODS

Madhubani district occupies an area of 3.501 square meters in, Srivastava, Dayawanti et al. (ed) (2010). The district ranges in East to Supaul and in the West to Sitamarhi, In South extends to Saharsa and North side spreads along the border area of Nepal. Madhubani was carved out from Darbhanga district in the year 1972 in the state of Bihar. This was formerly the northern subdivision of Darbhanga district. During the extensive survey 2011-2013 among all the 5 subdivision and 21 blocks from the data available in government organisation, non-government organisation as well as random sampling from people in different block has been done.

## RESULTS

There are 10,746 ponds in Madhubani district, distributed among the twenty one Blocks, known usually as Pokhar or Pokhari. The water area of ponds are identified as habitats and survival of variety of fishes, snails, crabs, insects, tortoise, frogs and snakes besides water weed and grass. They serve as a food chain and help maintaining cleanliness of pond water.

In Madhubani wetland area comprises 8958 hectare measuring 3.45 per cent of total wetland area of North Bihar. The table show the number of ponds as follows, block wise.

**Table 1: Anchal Wise Distribution of Jalkars (Area in ha) Madhubani**

| S.N. | Name of the Anchals | No. of Jalkars | Water Area |
|---|---|---|---|
| 1. | Rahika | 78 | 35.63 |
| 2. | Rajnagar | 94 | 49.57 |
| 3. | Benipatti | 473 | 197.19 |
| 4. | Basopatti | 134 | 74.02 |
| 5. | Lokhee | 305 | 105.22 |
| 6. | Khutauna | 220 | 105.90 |
| 7. | Andharatharhi | 212 | 134.36 |
| 8. | Ladania | 126 | 76.20 |
| 9. | Babubarhi | 246 | 116.38 |
| 10. | Jainagar | 15 | 8.32 |
| 11. | Khajauli | 20 | 9.59 |
| 12. | Kaluaahi | 30 | 11.32 |
| 13. | Phulparas | 255 | 127.98 |
| 14. | Ghoghardiha | 238 | 127.28 |
| 15. | Harlakhi | 276 | 162.61 |
| 16. | Madhavapur | 212 | 200.53 |
| 17. | Pandaul | 117 | 68.58 |
| 18. | Jhanjharpur | 103 | 68.44 |

| | | | |
|---|---|---|---|
| 19. | Bisfi | 165 | 69.53 |
| 20. | Madhepur | 73 | 38.32 |
| 21. | Lakhnaur | 163 | 66.14 |
| | Total | 3555 | 1853.21 |

**Table 2: Details of Ponds Area, Nature and Jamabandi of Sample Households**

| | Particulars | Madhubani |
|---|---|---|
| A. | Distribution of ponds | |
| | Small (upto 0.5 ha) | 14 (15.57) |
| | Medium (0.5 to 2 ha) | 12 (13.33) |
| | Large (above 2 ha) | 4 (4.44) |
| | Total | 30 (33.34) |
| B. | Nature of ponds | |
| | Govt. ponds (Jalkars) | 27 (25.23) |
| | Private ponds | 3 (2.80) |
| | Total | 30 (28.03) |
| C. | Area of ponds (in ha) | |
| | Govt. ponds (Jalkars) | 24.46 |
| | Private ponds | 2.50 |
| | Total | 26.95 |
| | Avt. (per ha) | 0.898 |
| D. | Rent/Jamabandi (In Rs./ha/annum) | 1484.81 |
| E. | Avg. size of pond (in ha) | 0.89 |

The above identified water bodies are potential sources of aquaculture in Madhubani district, which needs to be managed and utilized adopting advanced techniques and proper training methods to fish farmers to improve aquaculture in Madhubani district

Aquaculture in India has evolved as a viable commercial farming practice from a level of traditionally backward activity over last decades with considerable diversification in terms of species and systems, and has been showing an impressive annual growth rate of 6-7 percent. While the carp-based freshwater aquaculture, mainly constituted by the Indian major carps, such as, *Catla, rohu* and *mrigal*, has been contributing over 90 percent of the aquaculture production satisfying the domestic need, the Shrimp based aquaculture contributes only about 5% of the export earnings. The sector has also shown considerable diversification in recent years with the adoption of other species like Catfishes and freshwater prawns. Integrated fish farming has also been developing farmers friendly. The development of protocol for ornamental fish breeding and management has provided important livelihood options for marginal and landless farmers in certain localities. Although aquaculture in India has reached the status of an industry, assessment of human resources required for fisheries sector has always been a debatable issue.

The fisheries sector contributes to the national income, exports, food and nutrition security and employment generation. The rapid growth of the sector has generated huge employment opportunities for professional, skilled and semi skilled workers for the different support activities such as construction and management of farms, hatcheries, feed mills, processing units etc. (Anjani, K. Joshi, P.K. &Pratap, S.B. 2003; Fisheries Sector in India : An over view of performance, policies and programs. In : Anjani K. Pradeep, K.K. & Joshi, P.K. (Eds.) A profile of people, Technologies and policies in Fisheries Sector in India, pp. 1-16; Anon, 2002, Aqua culture Authority News, Vol. 1(12), Dec. 2002).

Fishing in India employs about 14.5 million people in Bihar, the total production is about 319.10 metric tonnes, which is in comparison to West Bengal (1,447.260 metric tonnes) and Andhra Pradesh (1,010,830 metric tonnes), naturally

the people's employment is much below in comparison to these states (National aquaculture sector overview: India" Food and Agriculture Organisation of the United Nations, 2009). The estimated pond area of Madhubani district is 3743 hectares. In the district of Madhubani out of its geographical area of 3478 sq. km., the Wetland area is 8958 hectares is about 2.22% of geographical area. Open water (ha), post monsoon is 2411 (ha) and premonsoon is 2280 (ha). Main workers, who are engaged in aquaculture is almost 37,813.00 out of which male population 29,429.00 and female population is 8,384.0, per cent of workers in total population is 11.40.

Apart from traditional fisherman of the district other castes are also allied to the various processes of aquaculture viz. Schedule Caste, Muslims, Yadav and meagre population of Brahmins and Rajputs, especially in Madhepur block and Benipatti block. However, aquacultures became popular and are supported by large population of Madhubani district to improve their economy and livelihood apart from their agricultural activities. In addition to the main population a sizable number of workers as marginal workers of about 14,884.0 out of which male population are 3,781.0 and female population is about 11,103.0, reaching the percentage up to 11.40 of the total population.

## DISCUSSIONS

Aquaculture developments need greater planning in the larger regional and community contexts. Aquaculture must be environmental regulations, management oriented and resource and social problems coming in the crowded centuries. It is important to maintain that the best possible use of the productivity of natural resources is achieved by causing minimum possible radical alterations to natural environment.Vijverberg*et.al* (2009) proposed that, Aquaculture development must be undertaken in a broad inter-sectoral context, considering especially its interactions with agriculture, forestry and capture fisheries and its environmental consequences. Aquaculture is the farming of aquatic organisms, including fish, *mollucs*, *crustaceens* and aquatic plants. Farming implies some term of intervention in the rearing process to enhance production, such as regular stocking, feeding and protection from predators etc. This definition includes enhanced fisheries (Stock enhancement aquatic ranching and management of natural aquatic environment) within the scope of production system considered. The three Indian major carps namely *Catla*, *rohu* and *mrigal* contribute the bulk of production to the extent of 70 to 75 percent of the total freshwater fish production, followed by Silver carp, Grass carp, common carp, Catfishes forming a second important group contributing the balance of 25-30 percent. Fish and other aquatic organism's lives are found to have successful favourable condition because water in a pond is primary requirement for aquaculture. Several physicochemical features of water impose their influences for making the pond water most suitable for aquatic life.

Fish is one of the popularly consumed items in Bihar especially in Mithila region that consist of Madhubani district. It is fastest growing subsector indicating a growth rate of over 10 percent per annum (NABARD, 2006).The long-term sustainability of aquatic environment has raised concern over the environmental impact of vital sectors, due to its negative impact aquatic ecology and system (Halder, *et al* (2011). Intensification of aquaculture involves the use of highly nutritious feeds and other chemical products, which generates wastes that, in most cases are difficult to curtail and toxic to aquatic lives (Ali *et al*. 2009 and Pravakar, *et al* (2013)). Effluent water containing wastes are discharged in all aquaculture system. Discussion on aquaculture is the main topic, relating to the rising demand of animal food in the form of fish and shell fish and in the public health issues associated with aquaculture operations and adequate aquatic produce, with particular emphasis on safe levels of contaminants; special problems associated with bivalve molluscs and crustaceans; safe reuse of wastewater in aquaculture; interactions between aquaculture and the environment, to the impact

of aquaculture on natural habitats and their biota; aquatic diseases; mechanisms for future action; and guidelines for policymakers

## CONCLUSIONS

Madhubani district, heart of Mithila is known as land of ponds. The ponds of Madhubani are important for common need of community, livelihood and nutrition, recharging of groundwater. Fish is one of the popularly consumed items in Bihar and is fastest growing subsector indicating a growth rate of over 10 per cent per annum. Aquaculture acts like insurance against failure main crops in agriculture, creates employment and fulfil the needs of animal proteins for local population at cheaper rate.

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